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Predictive pressures do not override the effects of verb bias in syntactic parsing

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INTRODUCTION

Syntactic parsing is sensitive to

- predictive pressures (e.g., to complete an open dependency) ^[1]
- subcategory frequency information (e.g., how often a given verb takes a direct object vs. a sentential complement, aka *verb bias*) ^[2]

Reinterpretation of Past Findings^[3-4]

Garden path effects in sentences like (1) were taken to show reanalysis is the parsers' last resort ^[5]

- 1) "The government officials who accepted (that) the expensive gift had caused a scandal were quick to turn it away."

But these results may also be taken to show that comprehenders face predictive pressures to complete an open dependency *asap* (by interpreting "had caused a scandal" as the main clause predicate).

THE PRESENT STUDY

Question: *Can the predictive pressure to complete an open S-V dependency override the effects of verb bias?*

Past findings suggested it cannot ^[3], but participants may not have pursued a DO reading in SC-biased materials for independent reasons (e.g., implausibility of DO readings).

METHODS

We examined the effects of **verb bias x ambiguity** in sentences with **low vs. high predictive pressures**.

Low predictive pressure (Experiment 1A):

DO-bias: The policeman saw (that) the protesters/ had entered/ the plaza/ and was keeping a watchful eye on the situation.

SC-bias: The judge doubted (that) the witnesses/ could resist/ bribery/ and was calling for an investigation.

High predictive pressure (Experiment 1B):

DO-bias: The policeman who saw (that) the protesters/ had entered/ the plaza/ was keeping/ a watchful eye on the situation./

SC-bias: The judge who doubted (that) the witnesses/ could resist/ bribery/ was calling/ for an investigation./

- Experiments 1A & 1B were run in a single session with the same set of participants (n=22; 48 items).
- We quantify verb bias using a SC-DO ratio ^[6]
 - 12 DO-biased verbs (<0.5), e.g., accept, hear, establish, read
 - 12 SC-biased verbs (>2), e.g., argue, decide, realize, conclude
- The materials were normed to ensure that all readings (SC, DO, high and low attachments) are plausible.

HYPOTHESES AND PREDICTIONS

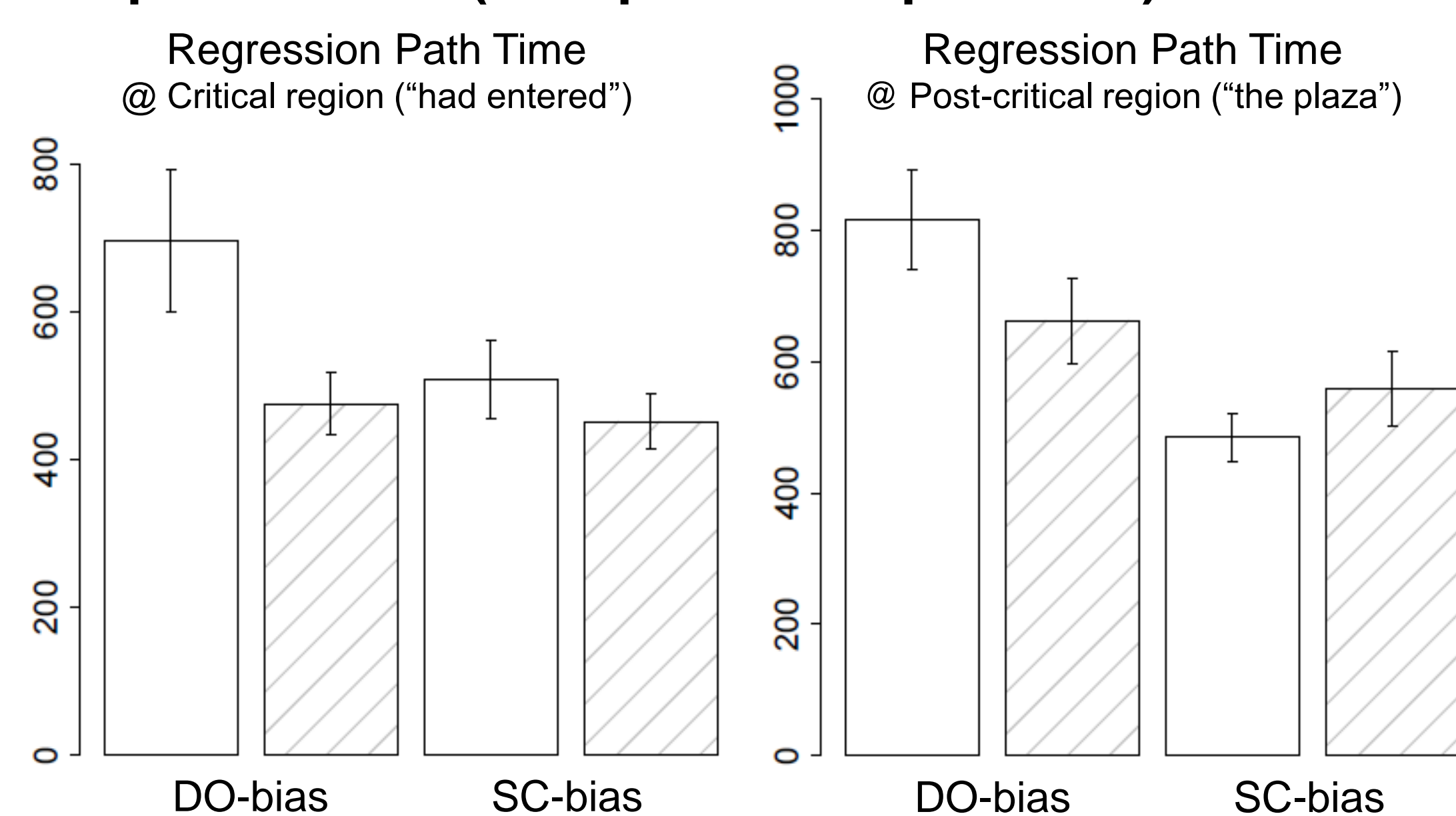
Experiment 1A: Based on previous results we expect to see a greatly reduced garden-path effect in SC-biased conditions than in DO-biased conditions.

Experiment 1B:

- If the predictive pressure to complete the main clause S-V dependency can override the effects of verb-bias
 - a garden-path effect regardless of verb bias
- If predictive pressure alone *cannot* override the effects of verb bias
 - a reduced garden-path effect in SC-biased conditions (as in Experiment 1A)

RESULTS

Experiment 1A (Low predictive pressure):

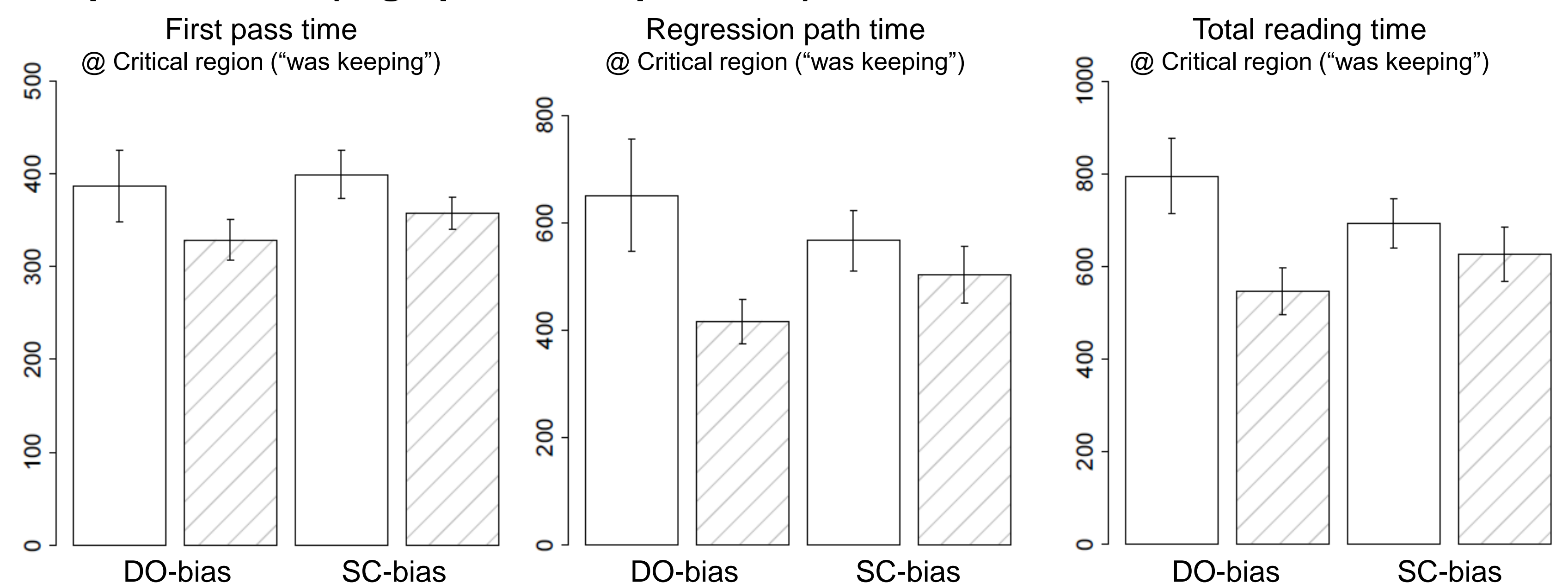


Summary

In both experiments, we observed a main effect of ambiguity in the critical region, which was followed by a **verb-bias x ambiguity interaction**:

- Exp 1: total time in the critical region + regression path and total time in the post-critical region
- Exp 2: total time in the critical region

Experiment 1B (High predictive pressure):



DISCUSSION

- We replicated Garnsey et al.'s classic findings in eye-tracking in Experiment 1A, which validated our verb bias manipulation.
- The reduced garden-path effect in the SC bias condition in Experiment 1B suggests that comprehenders pursued an SC analysis even when
 - i. the DO reading is highly plausible, and
 - ii. pursuing a DO analysis would allow them to complete the main clause S-V dependency sooner.
- These results add to recent findings on the limits of predictive processing.^[7]

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